



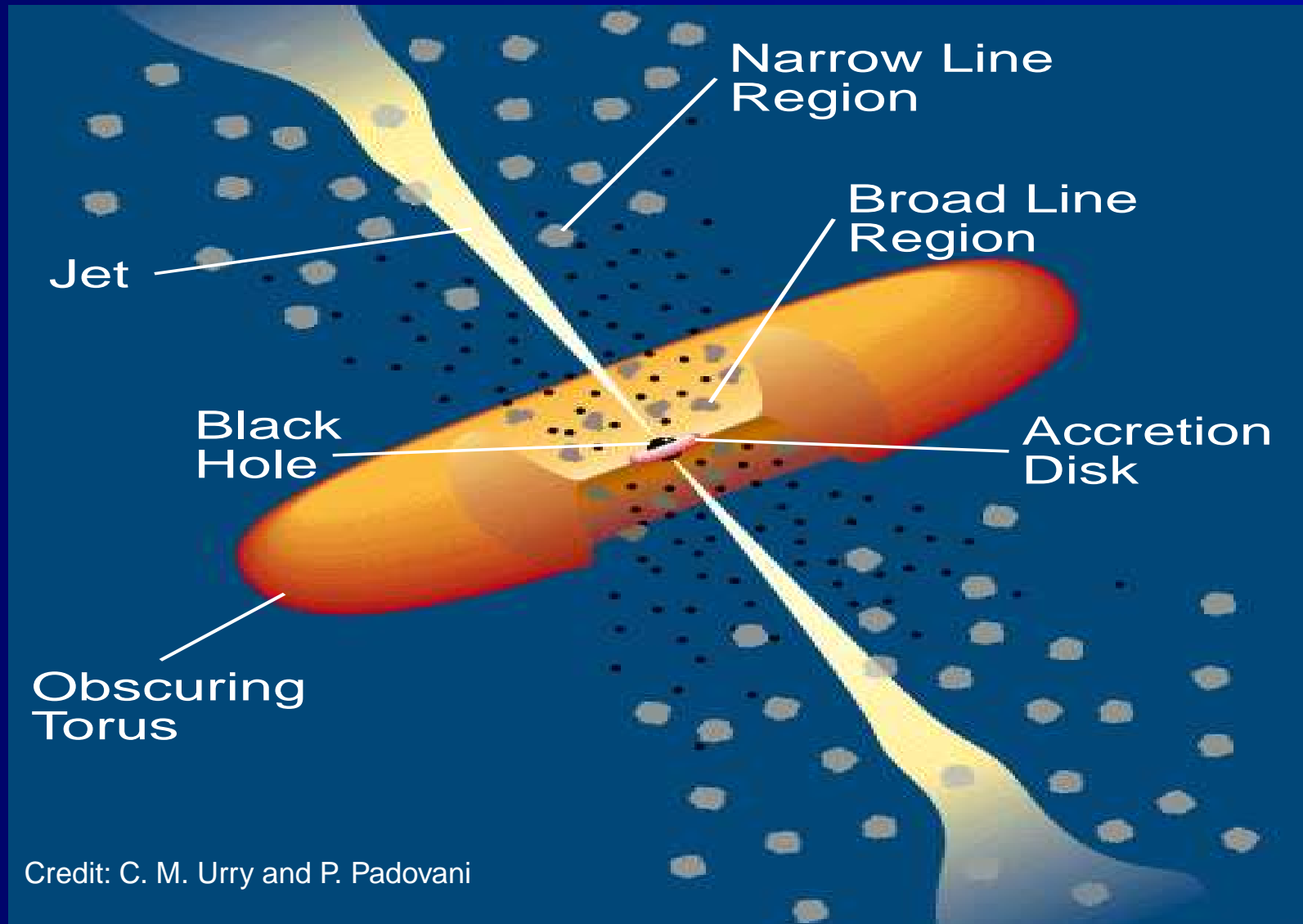
On the mid IR – hard X-ray correlation in AGN

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Why mid Infrared?



Previous work

Krabbe et al. (2001), ApJ 557: 626

N-band observations of 8 Seyfert galaxies

⇒ close correlation with X-rays

Lutz et al. (2004), A&A 418: 465

ISOPHOT-S spectra of 71 AGN

⇒ larger scatter in the correlation

In both studies no difference between Sy1s and Sy2s

Possible explanations

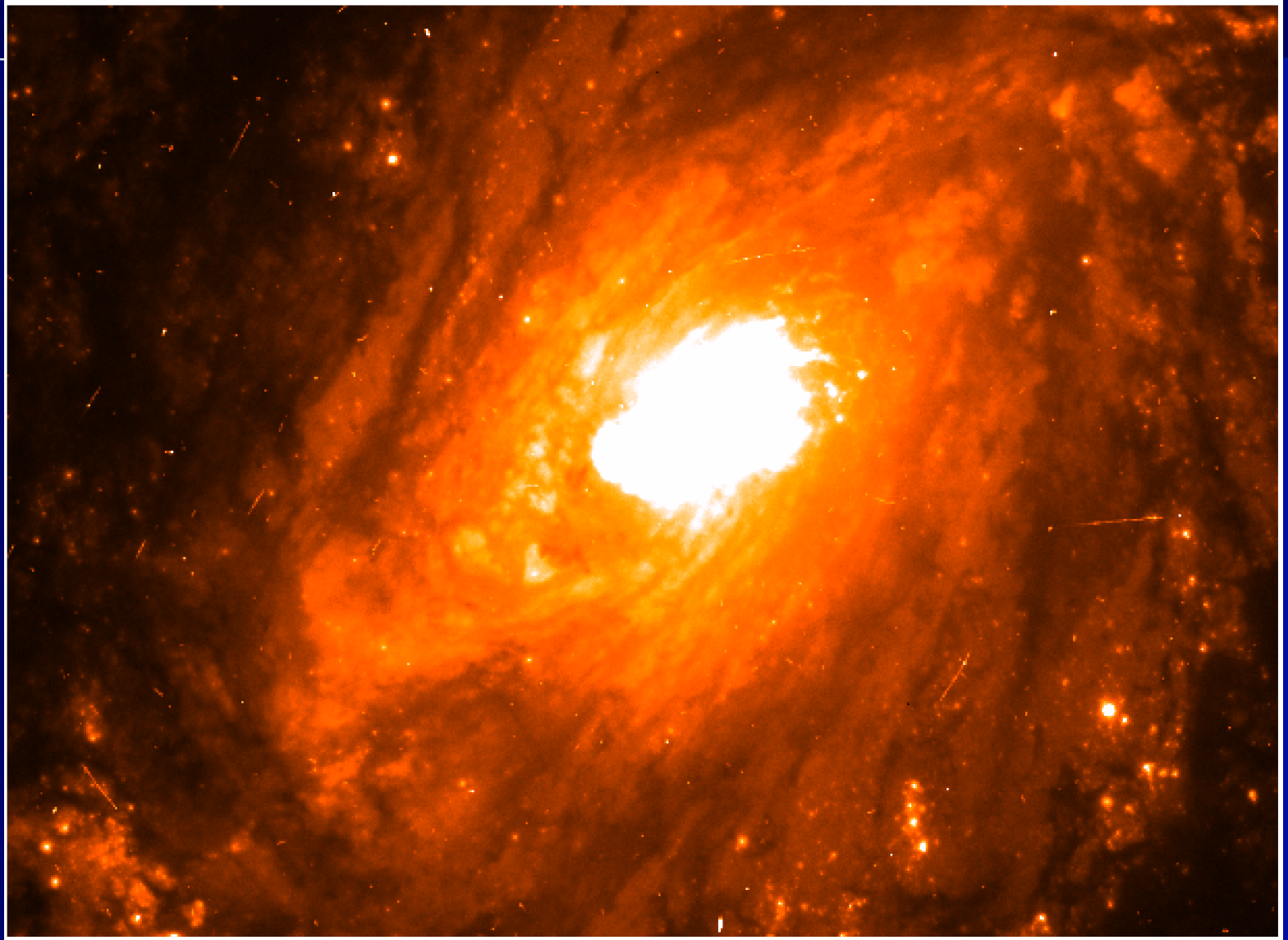
- Extended MIR emission
- Intrinsic X-ray variability
- Differing geometries

Possible explanations

- Extended MIR emission
- Intrinsic X-ray variability
- Differing geometries

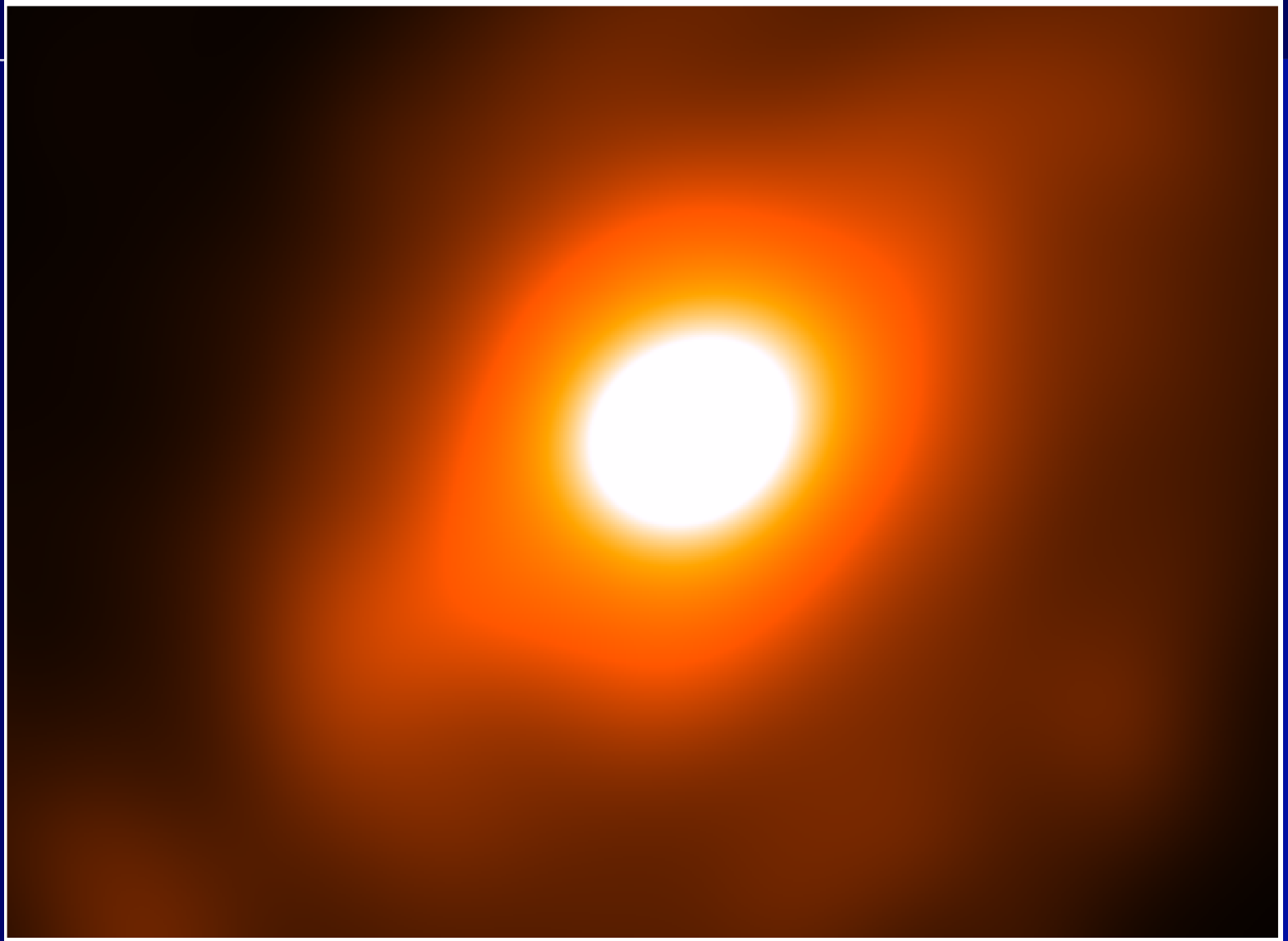
⇒ Higher angular resolution required

Resolution matters



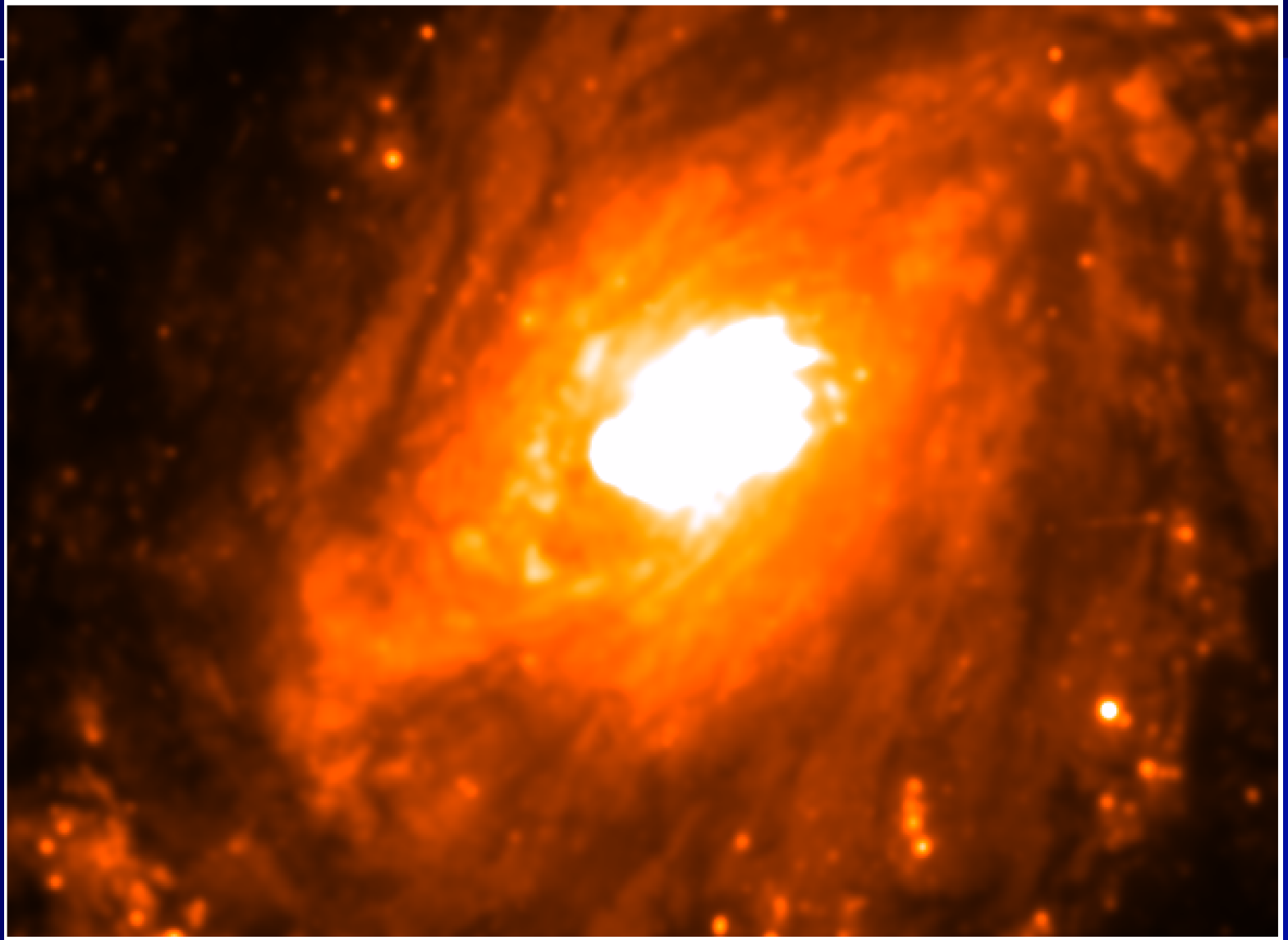
Hubble Space Telescope

Resolution matters



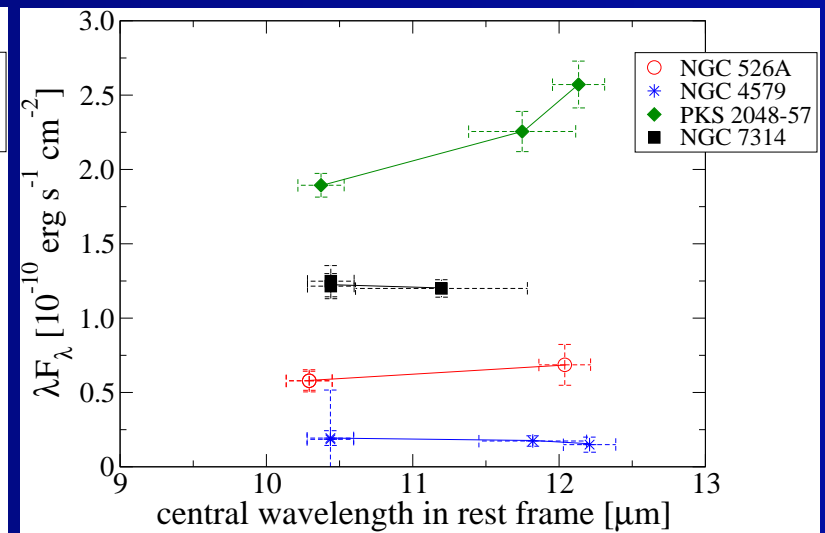
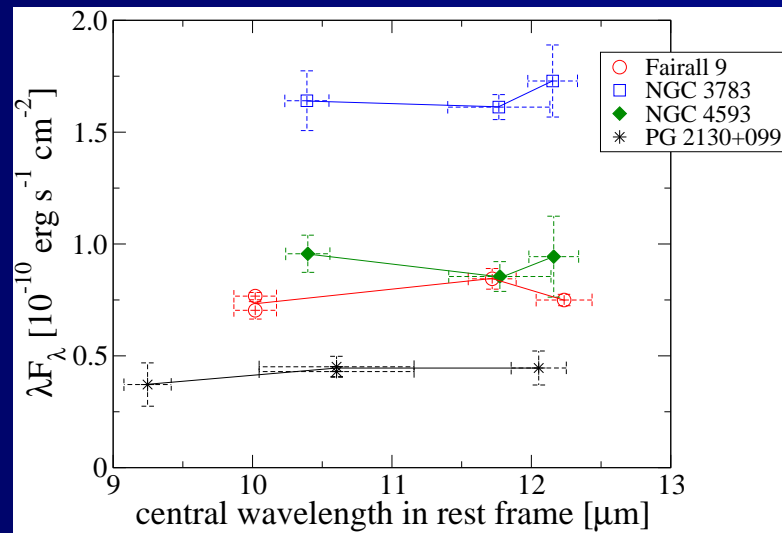
Infrared Space Observatory

Resolution matters



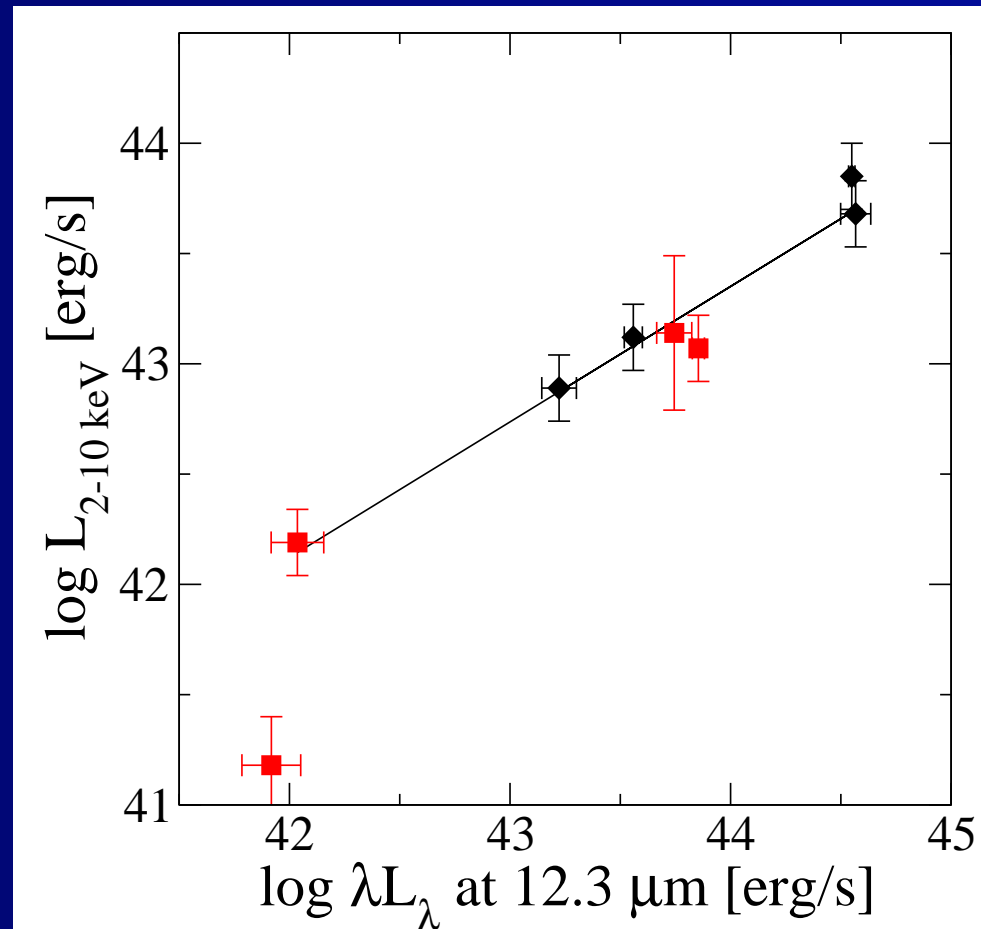
Very Large Telescope

New results 1



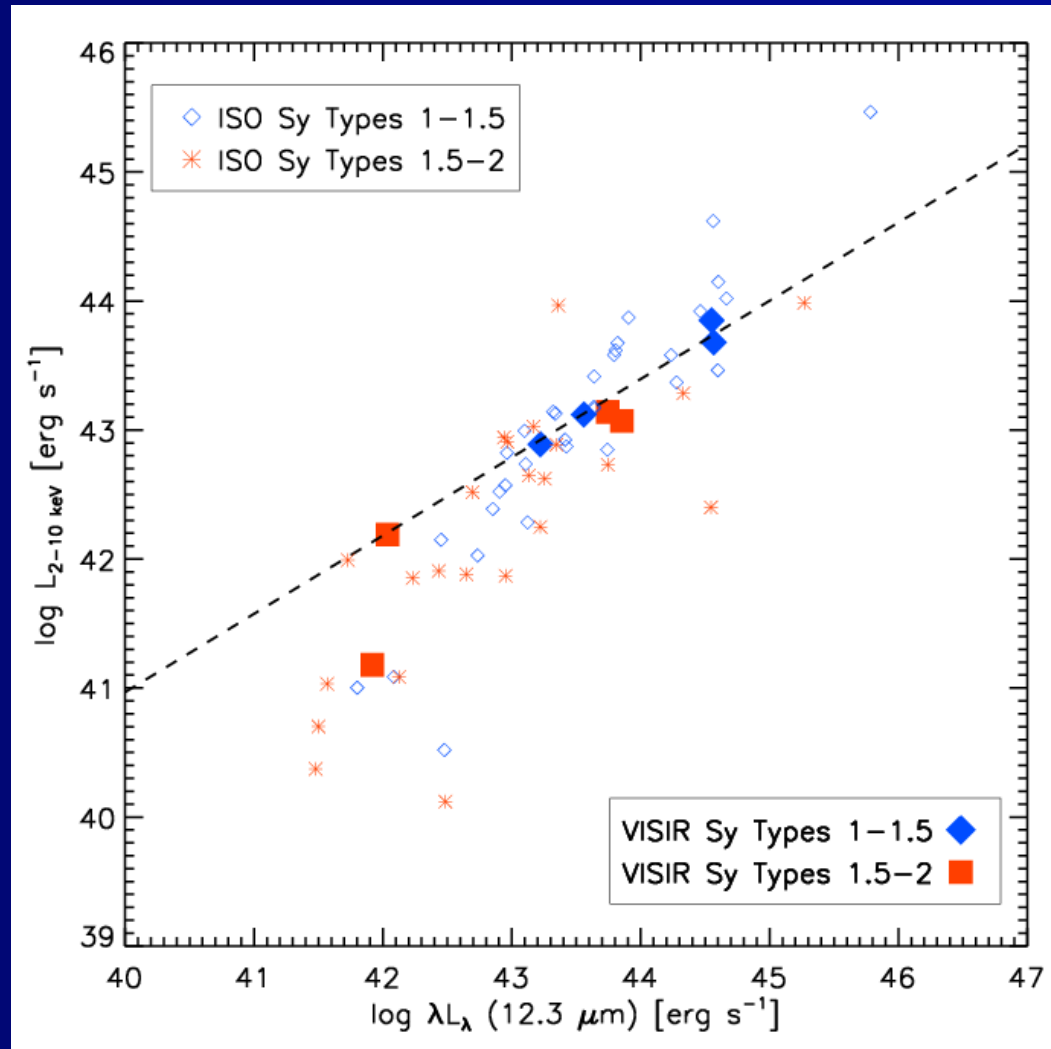
Horst et al. (2006): submitted to A&A

New results 2



$$\Rightarrow L_{\text{MIR}} \propto L_{\text{X}}^{1.6 \pm 0.22}$$

Comparison with previous results



Discussion

Dispersion of correlation reduced
⇒ as expected from unified scenarios

Still no difference between Sy1s and Sy2s
⇒ similarity probably intrinsic to AGN

Slope of 1.6 rather than 1.0
⇒ constraints on torus geometry

Conclusions

Only models of clumpy torus in agreement with results

The filling factor of clouds is probably small

Torus may be strongly flared: $H(r) \propto r^{2.0}$

H/r may depend on accretion rate: $H(r)/r \propto \dot{M}^{0.5}$

Beckert & Duschl (2004): A&A 426: 445

Outlook

Increase of our sample to 30 objects,
Observations ongoing

More detailed comparison with models